ORIGINAL RESEARCH PAPER

Nursing

KEY WORDS:

ASSESS THE EFFECTIVENESS OF INTERPRETIVE EDUCATIVE SESSION IN IMPROVING THE KNOWLEDGE ON INTERPRETATION REGARDING ARTERIAL BLOOD GAS VALUES AMONG CRITICAL CARE NURSES

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ABSTRACT

Background Of The Study

Arterial blood gas (ABG) analysis is one of the most basic tests of pulmonary function, performed routinely in hospitals throughout the world. The proper application of the concepts of acid base imbalance will help the health care provider not only to follow the progress of the patient but also to evaluate the effectiveness of care being provided.

Accurate assessment of the relationship between abnormal blood gas findings and a patient's overall clinical condition is a common challenge for critical care nurses. To meet this challenge, nurses must understand the mechanisms underlying acid-base balance and the common causes of acid-base imbalance. Considering this major problem, a study was carried out with a purpose of identifying the effectiveness of interpretive educative session in improving the knowledge on interpretation regarding arterial blood gas values among critical care nurses in a selected hospital at Indore.

AIM:- To assess the effectiveness of interpretive educative session in improving the knowledge on interpretation regarding arterial blood gas values among critical care nurses in selected hospitals at Indore''.

OBJECTIVES OF THE STUDY

The objectives of the study are to:

1.assess the knowledge on interpretation regarding arterial blood gas values among critical care nurses using an interpretive questionnaire.

2.assess the effectiveness of interpretive educative session in improving the knowledge on interpretation regarding arterial blood gas values among critical care nurses.

3.find the association between knowledge on interpretation regarding arterial blood gas values among critical care nurses and selected base line variables.

METHODOLOGY:

An evaluative approach with pre-experimental one group pre-test post-test design was used for this study. The study was carried out in a selected hospital at Mangalore. The samples, 30 critical care nurses, were selected from the various critical care units by non-probability purposive sampling technique. The data collection was done from 26/09/19 to 02/10/19 after obtaining permission and consent. Pre-test was conducted by administering a structured interpretive questionnaire, and an interpretive educative session on ABG values was given on the same day. Post-test was conducted on 7th day using the same structured interpretive questionnaire. The data was analyzed using descriptive and inferential statistics. Paired 't' test was used to find the effectiveness of interpretive educative session and chi-square test was used to find the association of pre-test knowledge score on interpretation with selected baseline variables.

Results

The findings showed that the mean post-test knowledge score on interpretation (21.30) was higher than the mean pre-test knowledge score on interpretation (9.00). The mean percentage knowledge score on interpretation of pre-test was higher in the area of respiratory acidosis with mean percentage of 45.83% and lower in the area of metabolic alkalosis (30%). Whereas the mean percentage knowledge score on interpretation of post-test was maximum in the area of respiratory acidosis (95%) and lower in the area of respiratory alkalosis (80.83%). The mean difference betweenpost-test and pre-test knowledge score on interpretation was highly significant (t29 = 14.20) at 0.05 level of significance. Hence the null hypothesis was rejected and research hypothesis was accepted, indicating that the interpretive educative session was an effective method of increasing the knowledge on interpretation of the critical care nurses, regarding arterial blood gas values.

It was also found that there was no significant association between pre-test knowledge score on interpretation with selected baseline variables such as age (χ21=0.00), gender (χ22=0.00), professional qualification (χ23=0.234), duration of clinical experience (χ24=0.14), area of clinical experience (χ25=3.34), attended any in-service education or CNE on ABG (χ26=0.00), at 0.05 level of significance.

INTRODUCTION:

An arterial blood gas (ABG) is a blood test that is performed using blood from an artery. It involves puncturing an artery with a thin needle and syringe and drawing a small volume of blood. The most common puncture site is the radial artery at the wrist, but sometimes the femoral artery in the groin or brachial artery is also used. The blood can also be drawn from an arterial catheter.[4]

An ABG is a test that measures the arterial oxygen tension (PaO_2), carbon dioxide tension ($PaCO_2$), and acidity (pH). In addition, arterial oxy-hemoglobin saturation (SaO_2) can be determined. Such information is vital when caring for patients with critical illness or respiratory disease. As a result, the ABG is one of the most common tests performed on patients in intensive care units (ICUs).[4]

NEED OF THE STUDY

ABG sampling represents the gold standard method for acquiring patient's acid-base status. Arterial blood gas analysis has become an essential skill for all health care practitioners. It provides important information with regard to adequacy of ventilation, oxygen delivery to the tissues and acid base balance. Although each patient's clinical presentation will be judged individually, situations that warrant analysis of a blood gas sample include respiratory compromise, post-cardio respiratory arrest, and evaluation of interventions such as oxygen therapy, respiratory support and as a baseline before surgery.

Problem Statement

''A study to assess the effectiveness of interpretive educative session in improving the knowledge on interpretation

regarding arterial blood gas values among critical care nurses in selected hospitals at Indore".

Objectives Of The Study:

1. assess the knowledge on interpretation regarding arterial blood gas values among critical care nurses using an interpretive questionnaire.
2. assess the effectiveness of interpretive educative session in improving the knowledge on interpretation regarding arterial blood gas values among critical care nurses.
3. find the association between knowledge on interpretation regarding arterial blood gas values among critical care nurses and selected base line variables.

Hypotheses

All hypotheses will be tested at 0.05 level of significance.

H_1: There will be a significant difference between the knowledge on interpretation regarding arterial blood gas values among critical care nurses before and after the interpretive educative session.

H_2: There will be a significant association between the knowledge on interpretation regarding arterial blood gas values among critical care nurses and the selected baseline variables.

Assumptions

The study assumes that:

- Critical care nurses may have inadequate knowledge on interpretation regarding arterial blood gas values.
- Interpretive educative session may be an effective method to improve the knowledge on interpretation regarding arterial blood gas values among critical care nurses.

Delimitations

The study is delimited to critical care nurses who are:

- Available during the data collection period.
- Willing to participate in the study.
- Working in the intensive care units of selected hospitals.

REVIEW OF LITERATURE

A prospective study was done in a trauma centre in Portland to find out the correlation of central venous and arterial blood gas measurements in mechanically ventilated trauma patients and the need for arterial puncture. 25 patients who were admitted to the intensive care unit and who required mechanical ventilation and had both central venous and arterial catheters were taken as the samples and comparison of 99 sets of venous blood gases (VBG) and ABG was done and the results were central venous and arterial PCO_2, pH, and base excess values correlate well and came to the conclusion that although VBGs cannot be substituted for ABGs in mechanicallyventilated trauma patients during the initial phases of resuscitation, clinically reliable conclusions can be reached withVBG analysis.[26]

A cross sectional analytical study was done in Iran to evaluate the validity of VBG and its clinical agreement with ABG in the 10 most common diseases in pediatric intensive care unit (PICU), and to answer how far it can replace the ABG test. 200 patients in 10 disease categories received blood gas analysis. Results of blood-gas tests such as pH, PCO_2 and HCO_3^- of both arterial and venous blood samples (simultaneously taken from each patient) were recorded and compared by statistical analysis (kappa statistics) to determine their validity and clinical agreement. The result showed that in some diseases such as respiratory distress syndrome, neonatal sepsis, renal failure, pneumonia, diabetic keto-acidosis and status epilepticus, VBG analysis showed a good validity (high sensitivity and specificity) accompanied by a suitable clinical agreement (over 40%), but in other diseases such as neonatal seizure, shock, congestive heart failure and congenital heart disease, there was either an inappropriately low validity or a weak clinical agreement (under 20%) and came to the conclusion that ABG is preferable and must not be replaced byVBG.

METHODOLOGY:

Pre-experimental one group pre-test, post-test design was adopted for this study. The pre-test (O_1) was carried out to determine the knowledge on interpretation regarding the arterial blood gas values and followed by the administration of the interpretive educative session (X). Post-test (O_2) was conducted on the 7th day following the pre- test and interpretive educative session. the sample consists of 30 critical care nurses.

Inclusion Criteria

- Critical care nurses irrespective of their gender and years of experience working in critical care units .
- Nurses who are present during data collection period.
- Nurses who can communicate in English.
- Nurses who have consented to participate.

Exclusion Criteria

- Critical care nurses who are on leave during data collection period.

Reliability Of The Tool

The reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring.The reliability of the tool was established using Split-Half method which measured the coefficient of internal consistency. The items were equally divided into two groups. Reliability of the half test was found by using Karl-Pearsons product moment correlation formula and Spearman Brown Prophecy formula. The reliability of the tool was r = 0.82 which indicated that tool was reliable.

Data Collection:

The study was conducted in Bombay hospital Indore M.P. 30 critical care nurses were selected by using non-probability purposive sampling technique. Confidentiality was assured to all subjects. The data was collected by using structured knowledge interpretive questionnaire in the critical care unit of Indore and the average time taken was 20-30 minutes. The post test was conducted after seven days by using the same structured knowledge interpretive questionnaire.

RESULTS

The findings showed that the mean post-test knowledge score on interpretation (21.30) was higher than the mean pre-test knowledge score on interpretation (9.00). The mean percentage knowledge score on interpretation of pre-test was higher in the area of respiratory acidosis with mean percentage of 45.83% and lower in the area of metabolic alkalosis (30%). Whereas the mean percentage knowledge score on interpretation of post-test was maximum in the area of respiratory acidosis (95%) and lower in the area of respiratory alkalosis (80.83%). The mean difference betweenpost-test and pre-test knowledge score on interpretation was highly significant ($t_{29} = 14.20$) at 0.05 level of significance. Hence the null hypothesis was rejected and research hypothesis was accepted, indicating that the interpretive educative session was an effective method of increasing the knowledge on interpretation of the critical care nurses, regarding arterial blood gas values.

It was also found that there was no significant association between pre-test knowledge score on interpretation with selected baseline variables such as age ($\chi 21=0.00$), gender ($\chi 22=0.00$), professional qualification ($\chi 23=0.234$), duration of clinical experience ($\chi 24=0.14$), area of clinical experience ($\chi 25=3.34$), attended any in-service education or CNE on ABG ($\chi 26=0.00$), at 0.05 level of significance.

Implications Of The Study

1. Nursing curriculum includes course on communication

skills, it needs to lay further emphasis on information as a process. Continuing nursing education should be conducted for need awareness, effective training material and AV aids to express the content area clearly for staff nurses should be utilized.

2. The present study revealed that the interpretive educative session regarding arterial blood gas values was an effective method to improve the knowledge on interpretation of critical care nurses. The nurse can take the role of a facilitator and educator and can educate the colleagues and the patients they care for, during their practice.

3. The findings of the study can be used by the nurse administrator to assess the need for educating the staff nurses regarding the interpretation of arterial blood gas values. The administrator, based on the felt needs, can plan the education program and also encourage staff nurses to do their duties in a better way.

4. Administration of interpretive educative session is an easy, simple and the best method to improve the knowledge on interpretation of these aspects. The nurse as well as the nursing students should be taught about the importance of nursing care delivered to the patients as well as in day to day nursing care activities.

Recommendations

On the basis of findings of the study, the following recommendations are being made:

1. A similar study can be replicated on a large sample to generalize the findings.

2. A similar study can be conducted amongst all the critical care nurses who are working in all areas of hospital

3. An experimental study can be undertaken with control group for effective comparison.

4. A comparative study can be conducted between critical care nurses and staff nurses.

5. A comparative study can be undertaken to compare the knowledge and practice of critical care nurses

6. Effectiveness of protocol implementation to improve the knowledge on interpretation of the critical care nurses on selected topic

7. Planned teaching programme to improve the knowledge on interpretation of critical care nurses on selected topic

8. A similar kind of study can be conducted using true experimental design so that generalization could be made.

REFERENCES:

1. Black MJ, Hawk HJ. Medical surgical nursing. 8th ed. Missouri: Elsevier; 2009.
2. Lemone P, Burke K. Medical surgical nursing critical thinking in client care. 4th ed. New Delhi: Pearson; 2008.
3. Cooper N. Acute care: Arterial blood gases. BMJ. 2004;20(4)105-7.
4. Wikipedia the free encyclopedia [Internet]. Edinburgh Wikipedia Foundation, Inc;[cited 2013 jan]. Available from URL: www. en. Wikipedia .org/wiki/ Arterial_blood_gas
5. Bounds LP. Gale encyclopedia for nursing and allied health. Blood gas analysis [online]. 2002 [cited 2011 Nov 15]. Available from: URL:www.healthline.com/gale content /blood gas analysis-1